



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

June 13, 017

Mr. Anthony R. Brown
Environmental Manager
Atlantic Richfield Company
4 Centerpointe Drive, LPR 4-435
La Palma, CA 90623-1066

**Subject: EPA comments on Atlantic Richfield (ARC) Interim 2015-2016 Upper Tributary Report
Leviathan Mine Site, Alpine County, California; dated November 2, 2016**

Dear Mr. Brown:

The U.S. Environmental Protection Agency (EPA) has reviewed Atlantic Richfield's (ARC) Interim 2015-2016 Upper Tributary Report Leviathan Mine Site, Alpine County, California; dated November 2, 2016. This work was submitted to EPA pursuant to Administrative Order for Remedial Investigation and Feasibility Study, Leviathan Mine, Alpine County, California (CERCLA Docket No. 2008-18, June 23, 2008).

Background: The Interim Upper Tributary Report was first presented March 18, 2014. EPA provided comments on June 16, 2014. EPA concurred with the March 18 report conclusion that additional monitoring is necessary, and noted that data such as water level measurements at weirs and piezometers were omitted from the report. Atlantic Richfield provided a revised report on July 9, 2014. EPA reviewed that document and provided comments on October 8, 2014. Atlantic Richfield provided a written response to comments on November 10, 2014.

In a February 4, 2015, letter to Atlantic Richfield, EPA noted that the response was incomplete. On March 31, 2015, ARC provided a revised report.

On September 14, 2015, EPA provided a response, clearly stating that the report remained incomplete and still did not clearly address EPA's earlier requests.

On November 20, 2015 ARC provided a response to EPA, and also responded to comments from the Lahontan Regional Water Quality Control Board (RWQCB) (dated May 5, 2015).

EPA provided comments on March 21, 2016; noting that ARC was adequately responsive to previous EPA comments; and requesting a Tributary Subsurface Flow Barrier Treatability Study report within 60 days after spring snow melt in 2016 that incorporates all previous comments and should follow the outline provided in Attachment A; no later than July 29, 2016.

On November 2, 2016, ARC provided the draft *Interim 2015-2016 Upper Tributary Report*, including additional monitoring data collected through mid-2016, and presented various graphical images depicting the monitoring data.

The report summarized investigation activities conducted since 2012 in support of evaluating the utility and design of a subsurface barrier to divert infiltrating water away from the site before it contacts mine waste. The report recommends continued monitoring because of consecutive drought years leading to only sporadic flow and water level observations to date.

EPA provides the following comments:

- **Previous EPA comments and Format:** In EPA's March 21, 2016 letter EPA directed ARC to incorporate all previous comments and follow the outline provided in Attachment A. EPA finds that the interim report adequately addresses EPA's comments.
- **Monitoring:** EPA concurs with ongoing monitoring activities. ARC shall ensure that this pathway is fully assessed as a source for acid drainage; particularly during wet conditions.

EPA provides the following additional General comments:

- **G1: Purpose and supporting information:** The purpose for this work is to determine if a subsurface barrier to intercept and divert infiltrating water away from mine waste at the southwest and southeast perimeter of Pond 2N and Pond 2S would meaningfully reduce the amount of acid drainage requiring treatment at the site. Please ensure the information is presented in a manner that assesses the shallow subsurface flow onto the site from the surrounding watershed. Specifically, review and present the flow of shallow subsurface groundwater to mine waste.

Please include cross section views depicting select information gathered from drilling and installation of the piezometers (PZ-40 through PZ-55) and wells (MW-06, -07, and -08) in this area, and water level monitoring to fully assess and evaluate the subsurface hydrology in this area. For example, Figure 2 from AMEC's December 12, 2011, memorandum "*Conceptual Design Evaluation Treatability Study for Subsurface Barrier Leviathan Mine Site Alpine County, California*" shows generalized sections of this area near Monitoring Well – 07. Please update with this information and include the mine waste/native soil interface, and range of water levels measured in the various piezometers (drive point and deep) and the monitoring wells. These types of cross sections are necessary to clearly present the information and provide a conceptual framework to estimate the quantity of subsurface flow under the southwest and southeast edges of Ponds 2N and 2S. Updated cross sections will allow rapid understanding of the work and its implications

- **G2: Piezometers 40 through 43 and Monitoring Well-07:** ARC as not included groundwater elevations for Piezometers 40 thru 43, or well 07 which were installed in 2011. The boring logs and piezometer/well construction details are not included. Please provide Groundwater elevations and well details for a complete understanding of the subsurface hydrology.

EPA provides the following additional new Specific comments

- **S1: Section 4.1 3rd Paragraph, Page 9:** The text refers to a standard operating procedure referenced to the RI/FS Quality Assurance Project Plan. Neither revision 1 or 2 of the Final Leviathan RI/FS QAPP contain SOPs. The text should be amended to reference the correct document containing SOPs.
- **S2: Section 7.0 Summary and Conclusions first bullet on Page 21:** The question from Section 2.0 Treatability Study Objectives concerns the total volume of water entering the site and is not limited to the volume of surface water that enters the subsurface (See Section 2.0 Question 1). Please revise the text for consistency.

ARC discusses stream flow losses without discussion of their significance. For example, the loss between SF-01 and SF-02 is noted as 7 gallons per minute (gpm), but it is unclear if the loss is significant with respect to the flow measurement error (precision and accuracy). If the loss is significant, the volume lost from the upper tributary to the subsurface (volume that could be intercepted and directed away from mine waste) should be readily estimated.

The text combines discussion of loss from the unlined portion of the Upper Tributary (*i.e.* flow at SF-02 minus the flow at SF-01) with the flow gain along the concrete lined portions of the Upper Tributary (*i.e.* flow at SF-03 minus flow at SF-02). Please separate the discussion of flow loss/gain for the reaches. In addition, discussion of the inflow to the lined reach of the Upper Tributary should be supported by citing appropriate data (groundwater levels in adjacent piezometers, field observations of overland flow, etc.) or removed from the text.

- **S3: Section 7.0 Summary and Conclusions second bullet on Page 21:** The question refers to surface water lost or gained upstream from the concrete channel. However, the discussion focuses on loss/gain within the concrete channel. Please revise the text to address the subject.
- **S4: Section 7.0 Summary and Conclusions fifth bullet on Page 21:** The question refers to surface water/groundwater interaction in the Upper Tributary where it contacts mine waste. The discussion focuses on groundwater in deep piezometers that cross the mine waste/native material interface beneath Ponds 2. While groundwater fluctuations in this zone are of interest to the RI/FS, they are not relevant to the groundwater/surface water interactions assessment of a cutoff wall at the southwest and southeast perimeter of the Pond 2 area. Please revise the text to fully discuss the surface water/groundwater interactions along the Pond 2 perimeter area.
- **S5: Section 7.0 Summary and Conclusions first bullet on Page 22:** The first sentence notes that groundwater in Piezometers 39 and 47 is 'unlikely to discharge to Leviathan Creek'. Please revise the text to include statements supported by data. *i.e.* the groundwater from these two piezometers does not discharge to the Upper Tributary, or the text should be deleted.

The second part of the paragraph speculates that shallow groundwater measured at the drive

point piezometers is the source for water flowing into the concrete lined reach of the Upper Tributary. Please include reference to supported evidence, or the text should be deleted

- **S6: Transducer Data:** The transducer data were not provided. Please provide.
- **Graphs:** The graphs are much improved from earlier reports. Additional improvements include:
 - **Graph 4-6:** Please separate the graphs of groundwater elevations by elevation range so that different scales can be used to depict meaningful detail. This could entail two or three additional graphs vertically stacked on the same page and with the same horizontal scales aligned so that DPZ, shallow, and deep piezometer fluctuations can be readily compared.
 - **Graph 4-8:** This graph appears to show a relationship between DPZ-3 shallow groundwater levels and flow at SF-02. This contradicts text in the third bullet of Section 7.0 on Page 20. Please revise the text.
 - **Graph 4-13:** This graph appears to show a relationship between PZ-55 groundwater levels and flow at SF-02. This contradicts text in the third bullet of Section 7.0 on Page 20. Please revise the text.
 - **Graph 5-2:** This graph illustrates that Upper Tributary flow measured at SF-01 is often more than flow measured at SF-02. This implies that significant loss of water may be occurring between the two stations. Please estimate the total volume of water lost and assess the value of a subsurface interceptor in this area. Please include text to discuss.

Within 30 days, or by July 13, 2017 ARC should provide a response that it concurs with these comments and will incorporate them as requested. Should ARC find that they disagree, do not concur, or will not incorporate EPA comments, then this should be discussed with EPA immediately to ensure that the Site RIFS submittal is satisfactory.

If you have any questions, please feel free to contact me at (415) 947-4183 or Deschambault.lynda@epa.gov.

Sincerely,



Lynda Deschambault
Remedial Project Manager

Cc by electronic Email:

Norman Harry, Washoe Tribe of Nevada and California
Douglas Carey, California Regional Water Quality Control Board, Lahontan Region
David Friedman, Nevada Department of Environmental Protection
Kenneth Maas, United States Forest Service
Tom Maurer, United States Fish and Wildlife Service
Toby McBride, United States Fish and Wildlife Service
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Marc Lombardi, AMEC